

Amendments to the Claims

This listing of claims replaces all prior versions and listings of claims in the application.

Listing of Claims

1. (Original) A method of manipulating a disc tissue of an intervertebral disc, the disc having a nucleus pulposus, an annulus fibrosus, and an inner wall of the annulus fibrosus, the method comprising:

providing a catheter having a radiofrequency electrode at a distal region of the catheter and a proximal region for externally guiding the distal region of the catheter within an intervertebral disc;

positioning the electrode at the inner wall of the annulus fibrosus by applying a sufficient force to advance the catheter through the nucleus pulposus to the inner wall of the annulus fibrosus, which force is insufficient to puncture the annulus fibrosus; and

delivering energy to the disc tissue using the electrode.

2. (Original) The method of claim 1, wherein the catheter defines a lumen.

3. (Original) The method of claim 1, wherein the step of providing a catheter is followed by the steps of:

providing an introducer with a proximal end and a distal end and having an introducer lumen with a distal opening at a terminus of the introducer;

inserting the introducer into the disc so that the proximal end of the introducer is external to the body and the distal opening of the introducer lumen is internal to the body; and

slidably inserting the catheter into the introducer.

4. (Original) The method of claim 3, wherein the distal end of the introducer is internal to the nucleus pulposus.

5. (Original) The method of claim 3, wherein the distal end of the introducer is adjacent to an opening in the annulus fibrosus communicating with the nucleus pulposus.

6. (Currently amended) A method of manipulating a disc tissue at a selected location of the intervertebral disc, the disc having a nucleus pulposus, an annulus fibrosus, and an inner wall of the annulus fibrosus, the method comprising:

providing a catheter having a radiofrequency electrode at a distal region of the catheter and a proximal region for externally guiding the distal region of the catheter within an intervertebral disc;

positioning the electrode at the selected location of the disc by applying a sufficient force to advance at least a portion of the distal region of the catheter through the nucleus pulposus beyond a central region of the nucleus pulposus, which force is insufficient to puncture the annulus fibrosus; and

delivering energy to remove [[removing]] material at the selected location of the disc using the electrode.

7. (Original) A method of manipulating a disc tissue of an intervertebral disc, the disc having a nucleus pulposus, an annulus fibrosus, and an inner wall of the annulus fibrosus, the method comprising:

providing a catheter having a radiofrequency electrode at a distal region of the catheter and a proximal region for externally guiding the distal region of the catheter within an intervertebral disc;

positioning the electrode at a location selected from the group consisting of posterior medial inner, posterior lateral, anterior lateral and anterior medial wall of the annulus fibrosus or combinations thereof by applying a sufficient force to advance at least a portion of the distal region of the catheter through the nucleus pulposus beyond a central region of the nucleus pulposus, which force is insufficient to puncture the annulus fibrosus; and

delivering energy to the disc tissue using the electrode at the selected location.

8. (Original) A method of manipulating a disc tissue of an intervertebral disc, the disc having a nucleus pulposus, an annular fibrosus, and an inner wall of the annulus fibrosus, the method comprising:

providing a catheter having a radiofrequency electrode at a distal region of the catheter and a proximal region for externally guiding the distal region of the catheter within an intervertebral disc;

positioning the electrode at a first selected location of the disc by applying a sufficient force to advance at least a portion of the distal region of the catheter through the nucleus pulposus beyond a central region of the nucleus pulposus, which force is insufficient to puncture the annulus fibrosus;

delivering energy to the disc tissue at the first selected location of the disc using the electrode;

positioning the electrode at a second selected location; and

delivering energy to the disc tissue at the second selected location of the disc using the electrode.

9. (Original) A method of manipulating a disc tissue at a selected location of an intervertebral disc, the disc having a nucleus pulposus, an annulus fibrosus, and an inner wall of the annulus fibrosus, the method comprising:

providing a catheter having a radiofrequency electrode at a distal region of the catheter and a proximal region for externally guiding the distal region of the catheter within an intervertebral disc;

positioning the electrode at the selected location of the disc by twisting the proximal region of the catheter and applying a sufficient force to advance at least a portion of the distal region of the catheter through the nucleus pulposus beyond a central region of the nucleus pulposus, which force is insufficient to puncture the annulus fibrosus; and

delivering energy to the disc tissue at the selected location of the disc using the electrode.

10. (Original) A method comprising:

introducing an intervertebral disc apparatus within an intervertebral disc such that a radiofrequency electrode incorporated into the apparatus at a distal region of the apparatus is advanced beyond a central region of a nucleus pulposus of the disc to a selected location; and

delivering energy from the electrode positioned at the selected location such that no vaporization of intervertebral disc tissue occurs when energy is delivered.

11. (Withdrawn) A method comprising:

introducing an intervertebral disc apparatus within an intervertebral disc such that a radiofrequency electrode incorporated into the apparatus at a distal region of the apparatus is advanced beyond a central region of a nucleus pulposus of the disc to a selected location; and
delivering energy from the electrode positioned at the selected location such that no material other than water is removed at the selected location of the intervertebral disc when energy is delivered.

12. (Withdrawn) A method comprising:

introducing an intervertebral disc apparatus within an intervertebral disc such that a radiofrequency electrode incorporated into the apparatus at a distal region of the apparatus is advanced beyond a central region of a nucleus pulposus of the disc to a selected location; and
delivering energy from the electrode positioned at the selected location such that no destructive lesion is formed on a disc at the selected location of the intervertebral disc when energy is delivered.

13. (Original) A method comprising:

providing a catheter having a radiofrequency electrode at a distal region of the catheter;
advancing the electrode beyond a central region of a nucleus pulposus of an intervertebral disc to a selected location; and
delivering energy from the electrode positioned at the selected location.

14. (Original) The method of claim 13, wherein the electrode is positioned adjacent a portion of an inner wall of the disc which forms a region of the disc selected from the group consisting of: a posterior medial, posterior lateral, anterior medial and anterior lateral region of the inner wall of the annulus fibrosus.

15. (Original) The method of claim 13, wherein the electrode is positioned at a site of an annular fissure of the inner wall of the disc.

16. (Original) The method of claim 13, wherein delivering energy includes delivering thermal energy or electromagnetic energy.

17. (Original) The method of claim 13, wherein delivering energy includes delivering a controlled amount of energy such that no vaporization occurs in the disc.

18. (Withdrawn) The method of claim 13, wherein delivering energy includes delivering a controlled amount of energy such that no material other than water is removed from the disc.

19. (Withdrawn) The method of claim 13, wherein delivering energy includes delivering a controlled amount of energy such that no destructive lesion is formed in the disc.

20. (Original) A method comprising:
providing a catheter having a radiofrequency electrode at a distal region of the catheter;
positioning the electrode in the intervertebral disc;
advancing the electrode non-linearly within the intervertebral disc beyond a central region of a nucleus pulposus of the disc to a selected location; and
delivering energy to the selected location from the electrode positioned at the selected location.

21. (Original) The method of claim 20, wherein the electrode is positioned adjacent an inner wall of the disc.

22. (Original) The method of claim 20, wherein the electrode is advanced along a path with multiple degrees of curvature.

23. (Original) The method of claim 20, wherein the electrode is advanced to an inner wall of the disc.

24. (Original) The method of claim 20, wherein the selected location is selected from the group consisting of a posterior medial, posterior lateral, anterior medial, and anterior lateral region of an inner wall of an annulus fibrosus.

25. (Original) The method of claim 20, wherein the selected location is at a site of an annular fissure of an inner wall of the disc.

26. (Original) The method of claim 20, wherein delivering energy includes delivering thermal energy or electromagnetic energy.

27. (Original) The method of claim 20, wherein delivering energy includes delivering a controlled amount of energy such that no vaporization occurs in the disc.

28. (Withdrawn) The method of claim 20, wherein delivering energy includes delivering a controlled amount of energy such that no material other than water is removed from the disc.

29. (Withdrawn) The method of claim 20, wherein delivering energy includes delivering a controlled amount of energy such that no destructive lesion is formed in the disc.

30. (Original) The method of claim 20 wherein advancing the electrode non-linearly within the intervertebral disc comprises conforming the catheter sufficiently to an inner wall of an annulus fibrosus to contact multiple locations on the inner wall.

31. (Original) A method for delivering a controlled amount of energy adjacent an inner wall of an intervertebral disc comprising:

introducing an intervertebral disc apparatus within an intervertebral disc such that a functional element incorporated into the apparatus adjacent a distal end of apparatus is positioned adjacent a wall of the intervertebral disc; and

delivering energy from the functional element to the wall of the invertebral disc such that no vaporization of intervertebral disc tissue occurs when energy is delivered.

32. (Withdrawn) A method for delivering a controlled amount of energy adjacent an inner wall of an intervertebral disc comprising:

introducing an intervertebral disc apparatus within an intervertebral disc such that a functional element incorporated into the apparatus adjacent a distal end of apparatus is positioned adjacent a wall of the intervertebral disc; and

delivering energy from the functional element to the wall of the invertebral disc such that no material other than water is removed at or near the wall of the intervertebral when energy is delivered.

33. (Withdrawn) A method for delivering a controlled amount of energy adjacent an inner wall of an intervertebral disc comprising:

introducing an intervertebral disc apparatus within an intervertebral disc such that a functional element incorporated into the apparatus adjacent a distal end of apparatus is positioned adjacent a wall of the intervertebral disc; and

delivering energy from the functional element to the wall of the invertebral disc such that no destructive lesion is formed on a disc at or near the wall of the intervertebral disc when energy is delivered.